

In the Claims

Claims 1-85 (canceled).

Claim 86 (previously presented): A method comprising:

sending a first command to a plurality of wireless identification devices to select a first subset of the plurality of wireless identification devices in accordance with an arbitration scheme, the first subset associated with a first branch of a search tree corresponding to a tree search scheme, the first command requesting each of the plurality of wireless identification devices of the first subset to respond approximately simultaneously; and

sending a second command to the plurality of wireless identification devices to select a second subset of the plurality of wireless identification devices in accordance with the arbitration scheme, the second subset associated with a second branch of the search tree, the second command requesting each of the plurality of wireless identification devices of the second subset to respond in an independently selected one of a plurality of time slots in accordance with an Aloha scheme;

detecting a collision between at least two wireless identification devices of the plurality of wireless identification devices; and

skipping at least one level of the search tree in response to detecting the collision.

Claim 87 (previously presented): The method of claim 86, further comprising receiving a plurality of replies from the plurality of wireless identification devices in accordance with the arbitration scheme, each of the plurality of replies including a respective number independently generated by a respective wireless identification device to identify that wireless identification device.

Claim 88 (previously presented): The method of claim 87, wherein the number generated by a respective device is randomly generated.

Claim 89 (previously presented): The method of claim 86, further comprising sending a third command to request the plurality of wireless identification devices to respond approximately simultaneously, wherein the plurality of wireless identification devices comprises all wireless identification devices capable of communicating and participating in the arbitration scheme when the third command is sent.

Claim 90 (previously presented): The method of claim 89, wherein the third command comprises a mask, the mask to be used to select a portion of an identification number stored in each of the plurality of wireless identification devices for comparison to a value, the mask being "0", such that no portion of the identification number is selected.

Claim 91 (previously presented): The method of claim 86, wherein the first and second commands each comprise a mask and a value, the mask to be used to select a portion of an identification number stored in each of the plurality of wireless identification devices for comparison to the value.

Claim 92 (previously presented): The method of claim 91, wherein the mask indicates a bit length of the value.

Claim 93 (previously presented): The method of claim 92, wherein the mask corresponds to a level of the search tree, and the value corresponds to a subset within the level of the search tree.

Claim 94 (previously presented): The method of claim 92, wherein the mask is applied bitwise to the identification number to select the portion of the identification number.

Claim 95 (previously presented): The method of claim 86, further comprising receiving a plurality of replies from the second subset of the plurality of wireless identification devices in response to the second command, the second command comprising a mask to be used to select a portion of a number stored in each of the plurality of wireless identification devices for comparison to a value, the plurality of replies excluding the portion of the number.

Claim 96 (previously presented): The method of claim 86, further comprising sending a plurality of signals in accordance with the Aloha scheme, each of the plurality of signals indicating to the second subset of wireless identification devices a beginning of each of the plurality of time slots.

Claim 97 (previously presented): A method comprising:

sending a first command to a plurality of wireless identification devices to select a first subset of the plurality of wireless identification devices and to request each wireless identification device of the first subset to respond in an independently selected one of a first number of time slots in accordance with an adaptive Aloha scheme; and

sending a second command to the plurality of wireless identification devices to select a second subset of wireless identification devices and to request each wireless identification device of the second subset to respond in an independently selected one of a second number of time slots in accordance with the adaptive Aloha scheme.

Claim 98 (previously presented): The method of claim 97, wherein the first and second commands each include a respective value to indicate which of the plurality of wireless identification devices are members of the first subset and which of the plurality of wireless identification devices are members of the second subset.

Claim 99 (previously presented): The method of claim 98, further comprising a wireless identification device of the plurality of wireless identification devices receiving the value and comparing the value to a number stored in the wireless identification device to determine if the wireless identification device is a member of any of the first and second subsets.

Claim 100 (previously presented): The method of claim 98, wherein the value is selected to indicate that the first subset includes all wireless identification devices capable of communicating and participating in the adaptive Aloha scheme when the first command is sent.

Claim 101 (previously presented): The method of claim 97, wherein the first subset includes the second subset.

Claim 102 (previously presented): The method of claim 101, wherein the first subset includes all wireless identification devices capable of communicating and participating in the adaptive Aloha scheme when the first command is sent, and the second subset includes all wireless identification devices capable of communicating and participating in the adaptive Aloha scheme when the second command is sent.

Claim 103 (previously presented): The method of claim 101, wherein the second subset excludes at least one wireless identification device of the first subset that is identified before the second command is sent.

Claim 104 (previously presented): The method of claim 103, further comprising receiving an error-free response from the one wireless identification device of the first subset in response to the first command before the second command is sent, the error-free response including at least a portion of an identification number of the one wireless identification device.

Claim 105 (previously presented): The method of claim 97, further comprising:
receiving a first plurality of replies in response to sending the first command, each of the first plurality of replies including a respective value independently generated by each respective wireless identification device of the first subset; and
receiving a second plurality of replies in response to sending the second command, each of the second plurality of replies including a respective value independently generated by each respective wireless identification device of the second subset.

Claim 106 (previously presented): The method of claim 105, wherein the respective values are each randomly generated.

Claim 107 (previously presented): The method of claim 105, wherein the respective values are each four bits long.

Claim 108 (previously presented): The method of claim 107, wherein each of the first and second plurality of replies further includes a unique identification number.

Claim 109 (previously presented): The method of claim 108, further comprising sending a third command individually addressed to one of the plurality of wireless identification devices by sending a four bit value independently generated by the one of the plurality of wireless identification devices.

Claim 110 (previously presented): The method of claim 97, wherein the second number of time slots is different than the first number of time slots, and is determined based on a number of responses received without collision.

Claim 111 (previously presented): The method of claim 110, wherein the second number of time slots is selected to be less than the first number of time slots if a predetermined number of responses are received without collision in response to the first command.

Claim 112 (previously presented): The method of claim 97, further comprising sending a plurality of signals in accordance with the adaptive Aloha scheme, each of the plurality of signals indicating a beginning of each of the time slots.

Claim 113 (previously presented): The method of claim 97, wherein the one of the second number of time slots in which to respond is independently selected by each respective one of the plurality of wireless identification devices of the second subset using an independently generated respective random number.

Claims 114-118 (cancelled).

Claim 119 (previously presented): A wireless identification device comprising:

a receiver operable to receive a first command comprising a first value, and a second command comprising a second value, the first and second values to select a plurality of wireless identification devices;

a memory operable to store a unique identification number; and

a backscatter transmitter operable to transmit a first response in an independently selected one of a first plurality of time slots in accordance with an adaptive Aloha scheme if it is determined, using the first value, that the wireless identification device is to respond to the first command, the backscatter transmitter further operable to transmit a second response in an independently selected one of a second plurality of time slots in accordance with the adaptive Aloha scheme if it is determined, using the second value, that the wireless identification device is to respond to the second command, the second plurality of time slots to be different in number than the first plurality of time slots.

Claim 120 (previously presented): The device of claim 119, wherein the first and second responses are to include a four bit number independently generated by the wireless identification device in addition to the unique identification number, the four bit number to be used to individually address the wireless identification device.

Claim 121 (previously presented): The device of claim 119, wherein the backscatter transmitter is to time transmission of the first and second responses using synchronization pulses to be received by the receiver in accordance with the adaptive Aloha scheme.

Claim 122 (previously presented): The device of claim 119, wherein the selected one of the first plurality of time slots is to be selected by the wireless identification device using a first randomly generated number and the selected one of the second plurality of time slots is to be selected by the wireless identification device using a second randomly generated number.

Claims 123-124 (cancelled).

Claim 125 (new): A method comprising the steps of:

sending a first command to a plurality of wireless identification devices to select a first subset of the plurality of wireless identification devices in accordance with an arbitration scheme, the first subset associated with a first branch of a search tree corresponding to a tree search scheme, the first command requesting each of the plurality of wireless identification devices of the first subset to respond approximately simultaneously; and

sending a second command to the plurality of wireless identification devices to select a second subset of the plurality of wireless identification devices in accordance with the arbitration scheme, the second subset associated with a second branch of the search tree, the second command requesting each of the plurality of wireless identification devices of the second subset to respond in an independently selected one of a plurality of time slots in accordance with an Aloha scheme.

Claim 126 (new): A wireless identification device comprising:

a receiver to receive a first command comprising a first mask and a first value associated with a search tree of a tree search scheme, the first mask indicating a bit length of the first value;

a memory to store an identification number, a first portion of the identification number to be selected using the first mask and to be compared to the first value in response to receiving the first command in accordance with the tree search scheme; and

a backscatter transmitter to transmit a first response in an independently selected one of a plurality of time slots in accordance with an Aloha scheme if it is determined that the first portion of the identification number is equal to the first value.

Claim 127 (new): The device of claim 126, wherein the receiver is to receive a second command comprising a second mask of "0" and the backscatter transmitter is to transmit a second response in the independently selected one of the plurality of time slots regardless of the identification number.

Claim 128 (new): The device of claim 126, wherein:
the receiver is to further receive a second command comprising a second mask and a second value associated with the search tree of the tree search scheme, the second mask indicating a bit length of the second value;

a second portion of the identification number is to be selected using the second mask and is to be compared to the second value in response to receiving the second command in accordance with the tree search scheme; and

the backscatter transmitter is to further transmit a second response, without delay, in accordance with the tree search scheme if it is determined that the second portion of the identification number is equal to the second value.

Claim 129 (new): The device of claim 126, wherein the response excludes the first portion of the identification number.

Claim 130 (new): The device of claim 126, wherein the backscatter transmitter is to time transmission of the first response using synchronization pulses to be received by the receiver in accordance with the Aloha scheme.

Claim 131 (new): An interrogator comprising:

- a transmitter circuit operable to send a command comprising a mask and a value to a plurality of RFID devices to select a subset of the RFID devices associated with a branch of a search tree in accordance with a tree search scheme, the mask indicating a bit length of the value, the transmitter further operable to send coordination pulses to delimit a plurality of time slots during which the subset of the RFID devices are to respond in accordance with an Aloha scheme;
- a receiver circuit operable to receive a plurality of backscatter responses from the subset of the RFID devices; and
- a collision detection circuit operable to determine if there is a collision in the plurality of responses, the transmitter further operable to send an acknowledgement signal if a response is received without collision.

Claim 132 (new): A system comprising:

an interrogator to send a command to select a subset of a plurality of RFID devices and to provide coordination pulses to delimit time slots associated with an adaptive Aloha scheme; and

an RFID device affixed to an object to identify the object, the RFID device, responsive to the interrogator, to send an independently generated number along with a unique identification number in accordance with the adaptive Aloha scheme if the RFID device determines that the RFID device is a member of the subset, the interrogator to individually address the RFID device using the independently generated number.